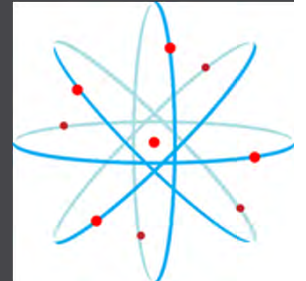


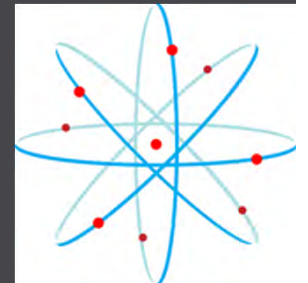
Radiation Therapy for Early Breast Cancer: Evolving Strategies

Timothy Wagner, MD, MBA



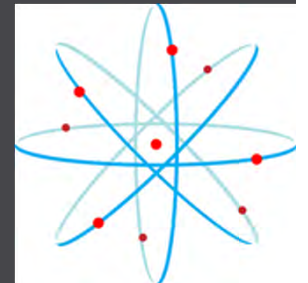
Introduction

- Radiation therapy is considered standard of care for most women who undergo breast conservation for breast cancer
- Radiation therapy consistently decreases the risk of in breast recurrence by 50-70% which may translate into a breast cancer specific survival benefit
- Radiation works by damaging the DNA of cancer cells which is the genetic material that controls how cells grow and divide. Cancer cells die due to their inability to repair the DNA damage.



Outline

- Standard Whole Breast Radiation Treatment Planning
- Emerging Techniques for Whole Breast Radiation
 - Deep Inspiratory Breath Hold
 - Prone
 - Hypofractionation
- Accelerated Partial Breast Irradiation (APBI)

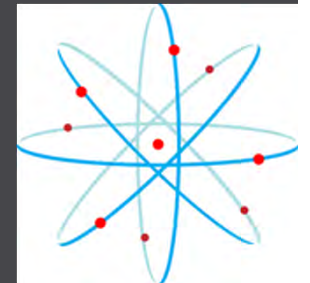
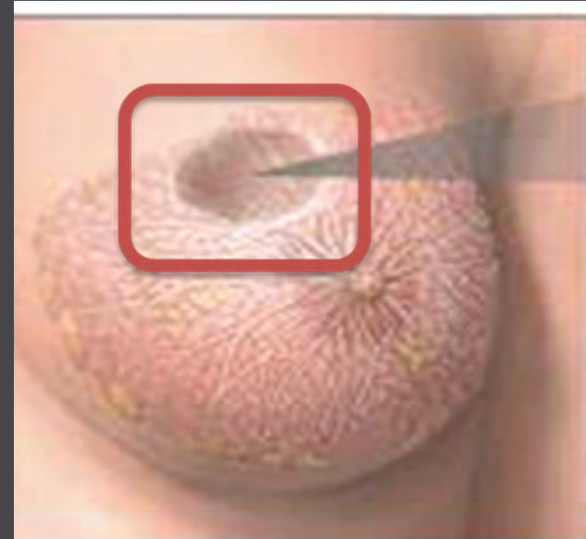


1st consideration: Radiation Therapy Target

- Whole Breast

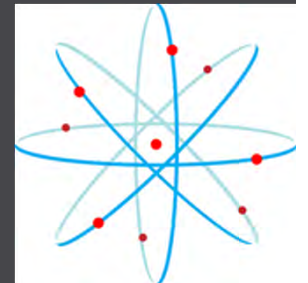


- Partial Breast

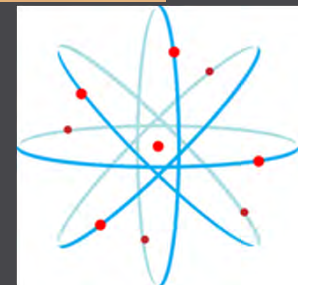
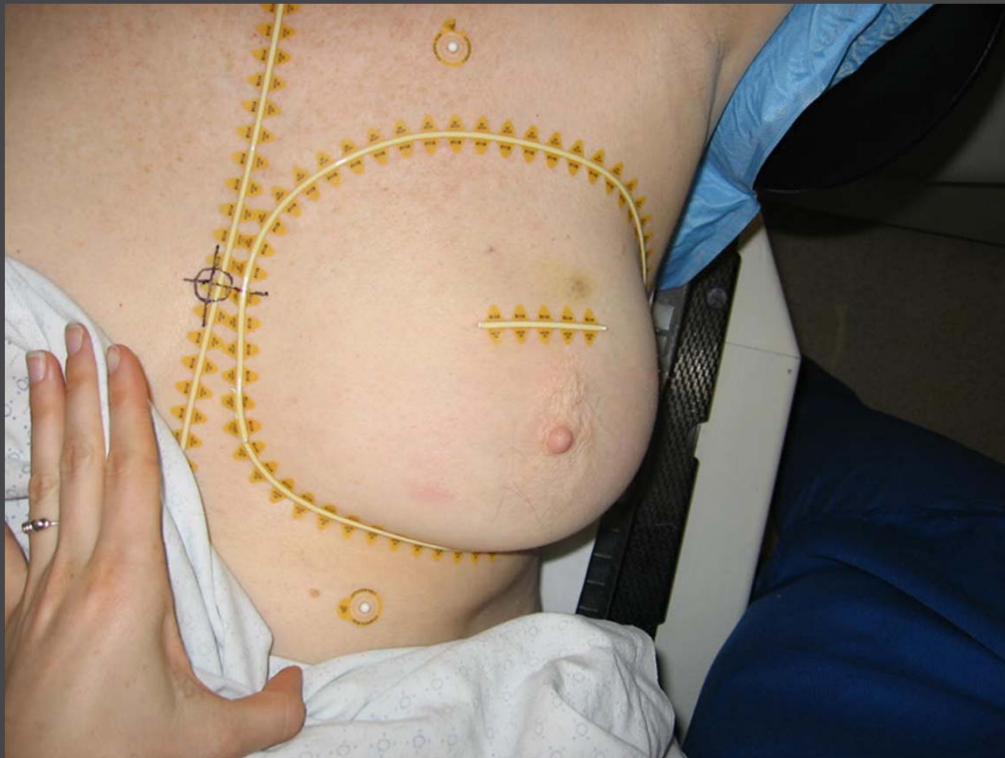


Whole Breast Radiation

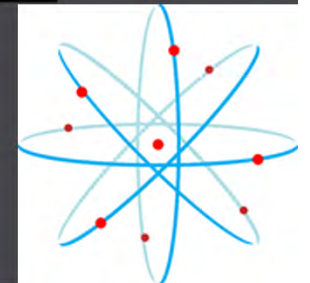
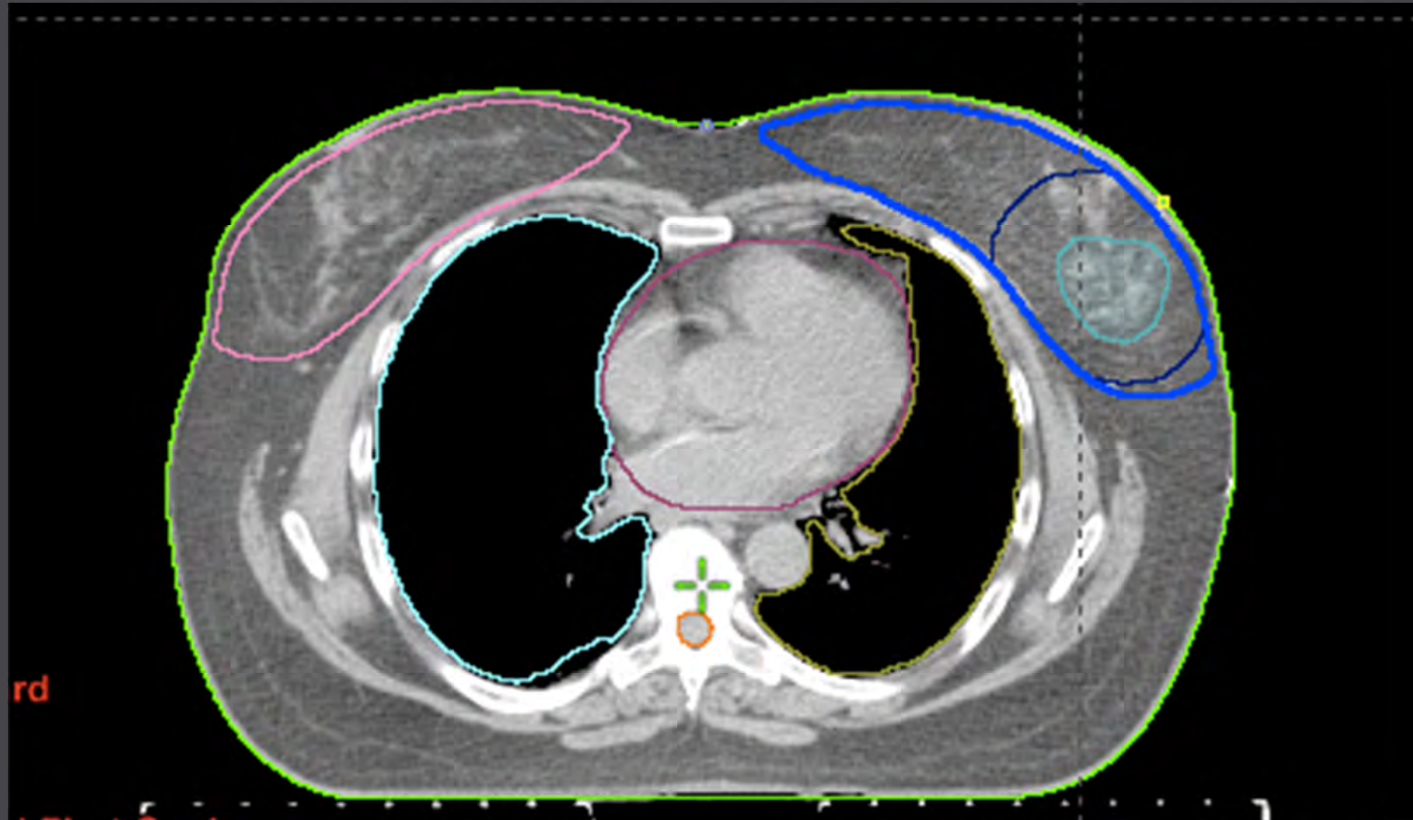
- Tried and true
 - Standard fractionation whole breast radiation
 - Approximately 6 weeks, daily Mon-Fri, 10 mins per day
 - Goals of modern whole breast treatment planning are to optimize:
 - dose homogeneity (which reduces skin effects)
 - dose conformality (which reduces dose to underlying heart and lungs)



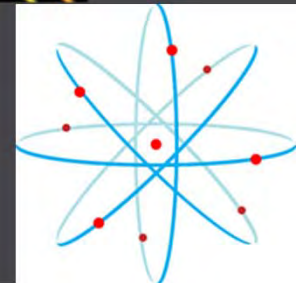
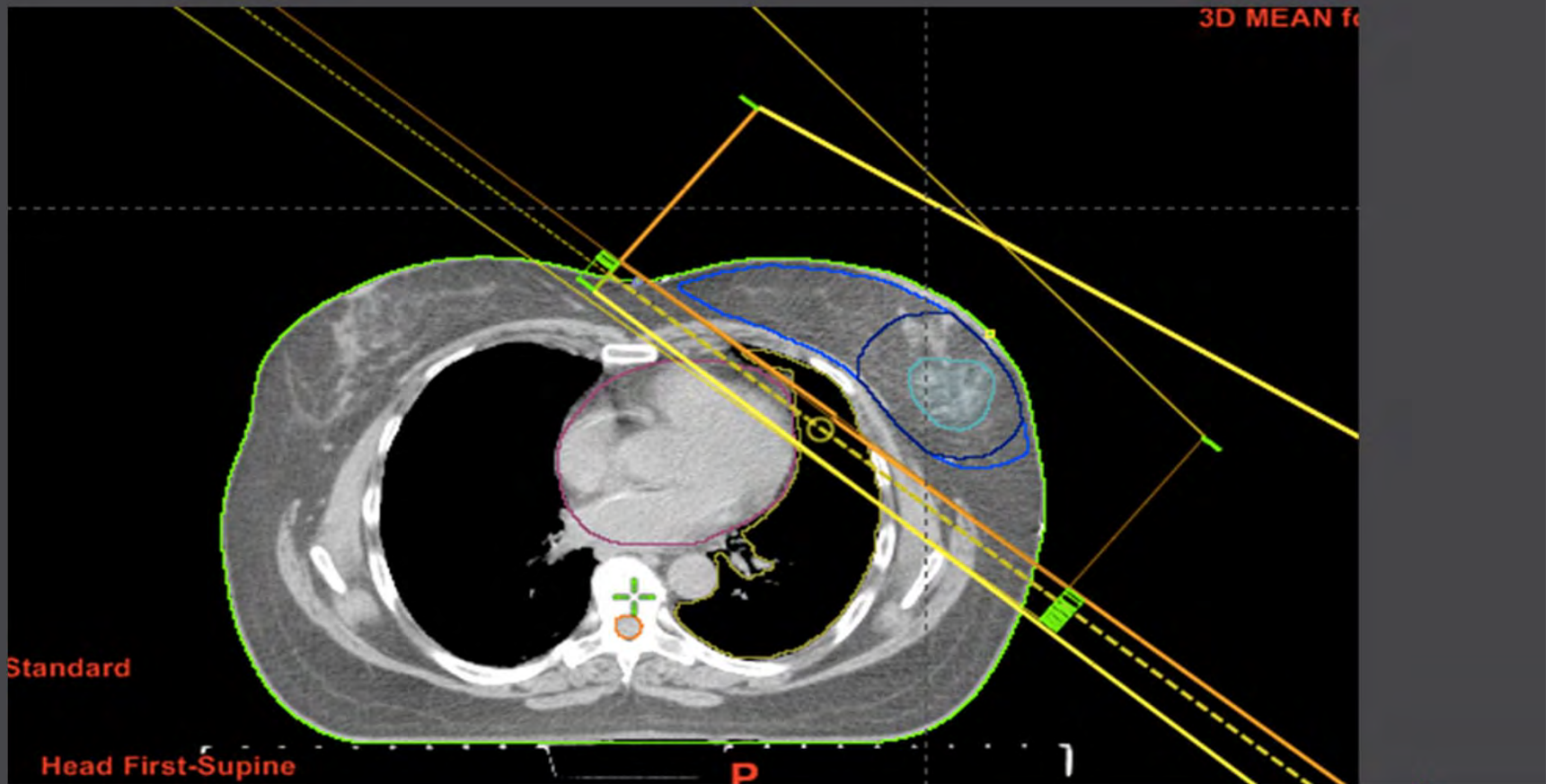
Simulation: CT scan in the treatment position



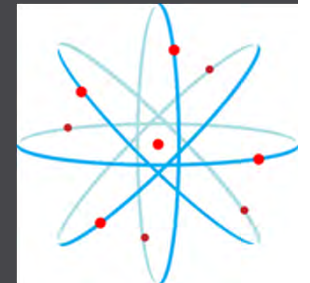
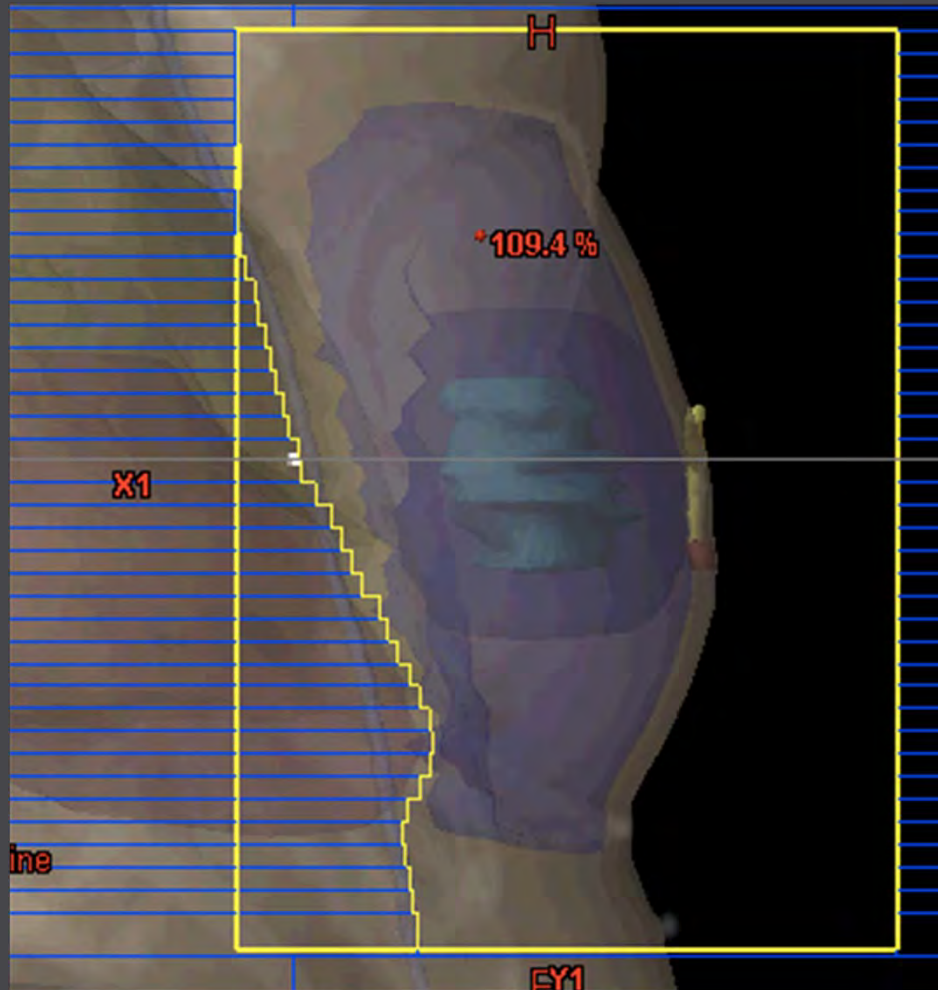
Contouring



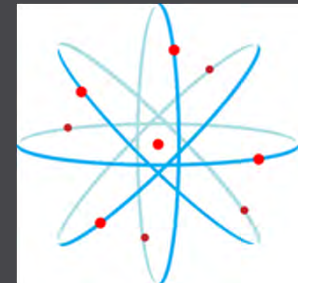
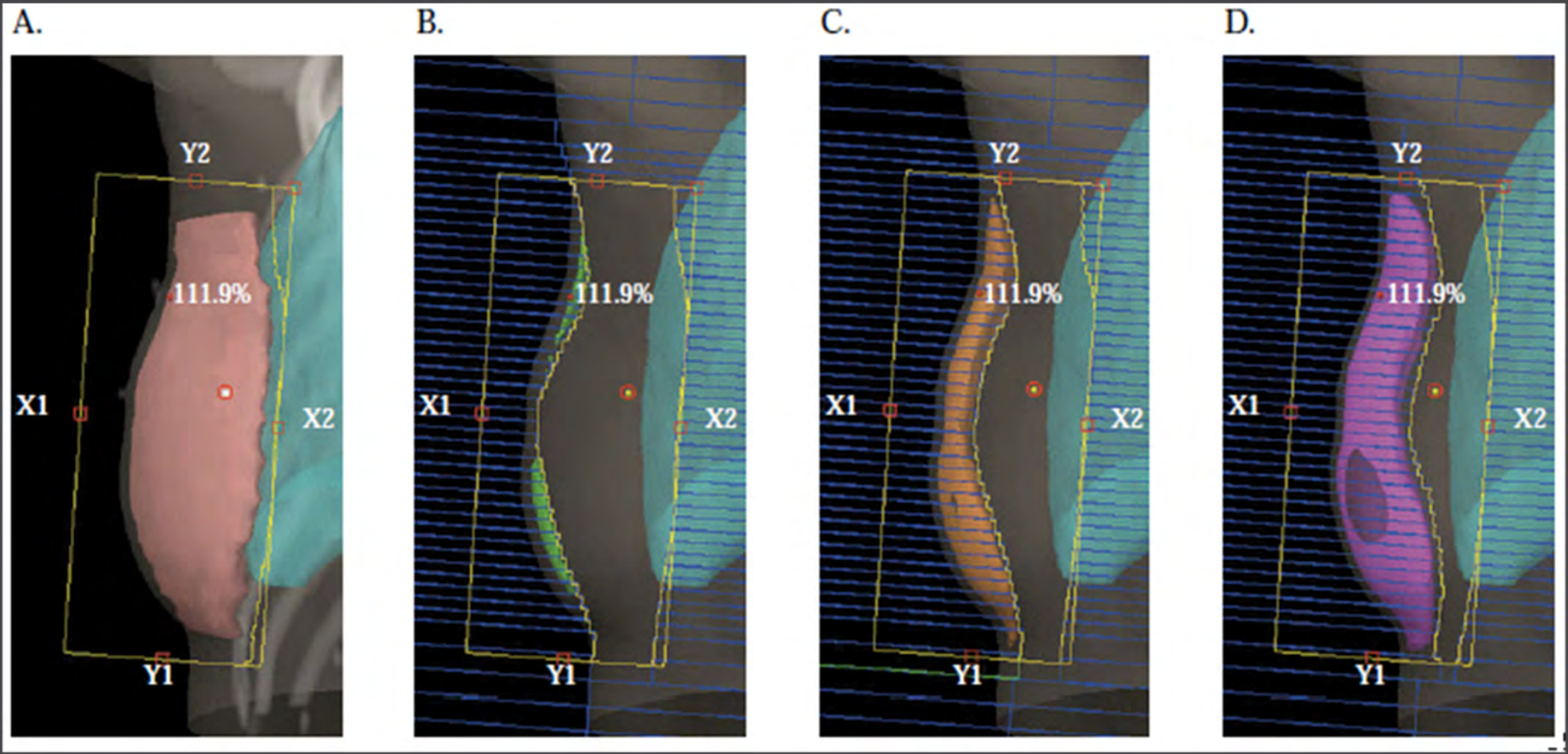
Field Placement



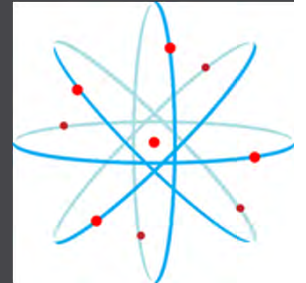
Achieving Conformality: Field Shaping



Achieving homogeneity: Field in Field



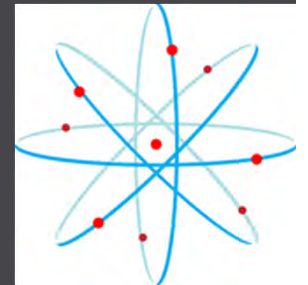
Treatment Delivery



Typical skin effects

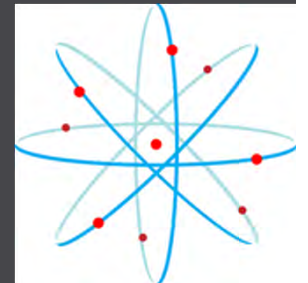


Appearance of radiated left breast at completion (A) and one month later (B)

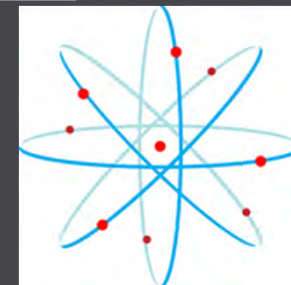
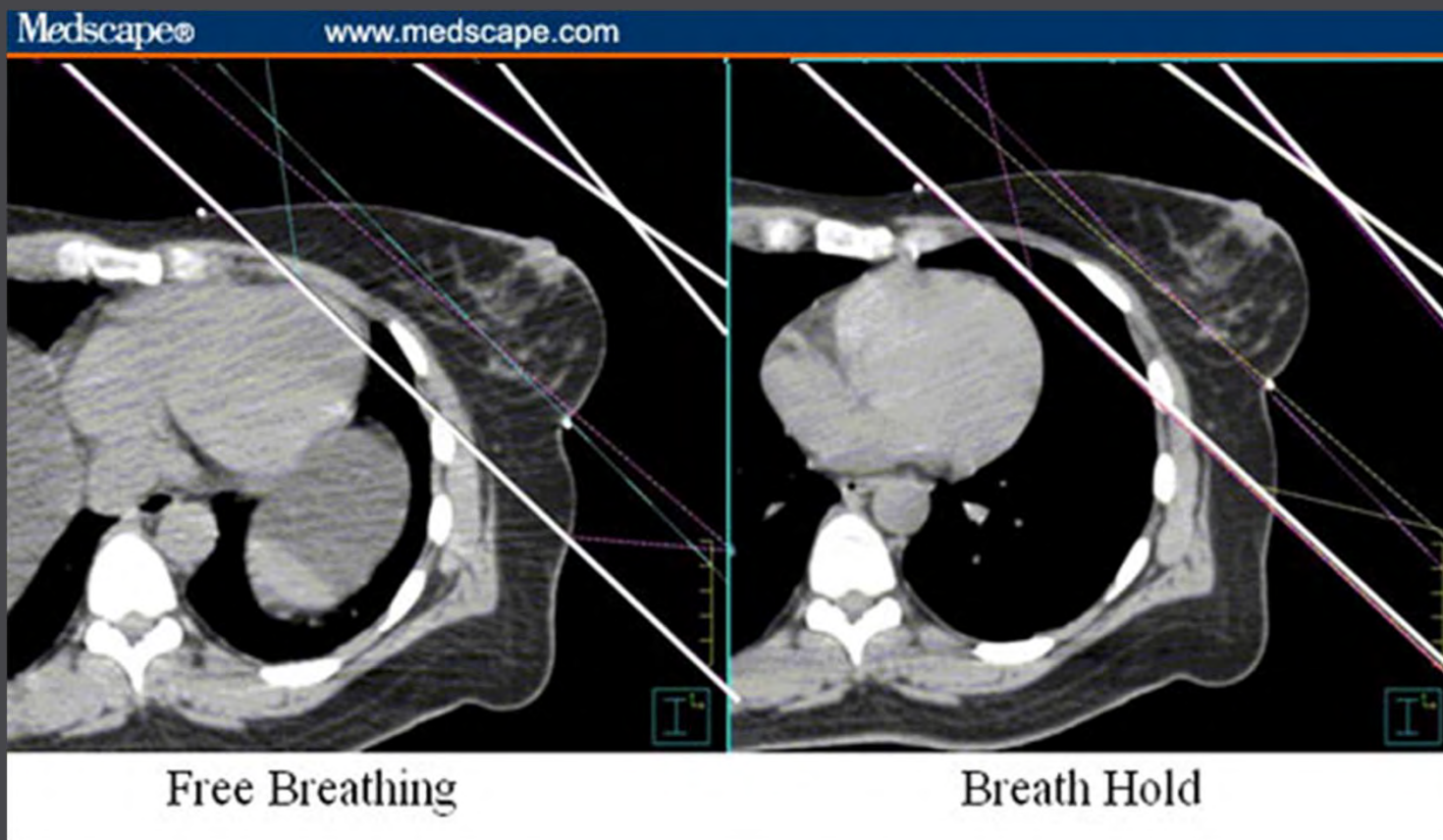


Emerging Techniques for Whole Breast Irradiation

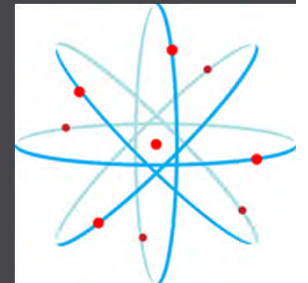
- Deep Inspiratory Breath Hold
- Prone
- Hypofractionation



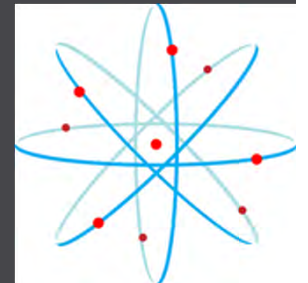
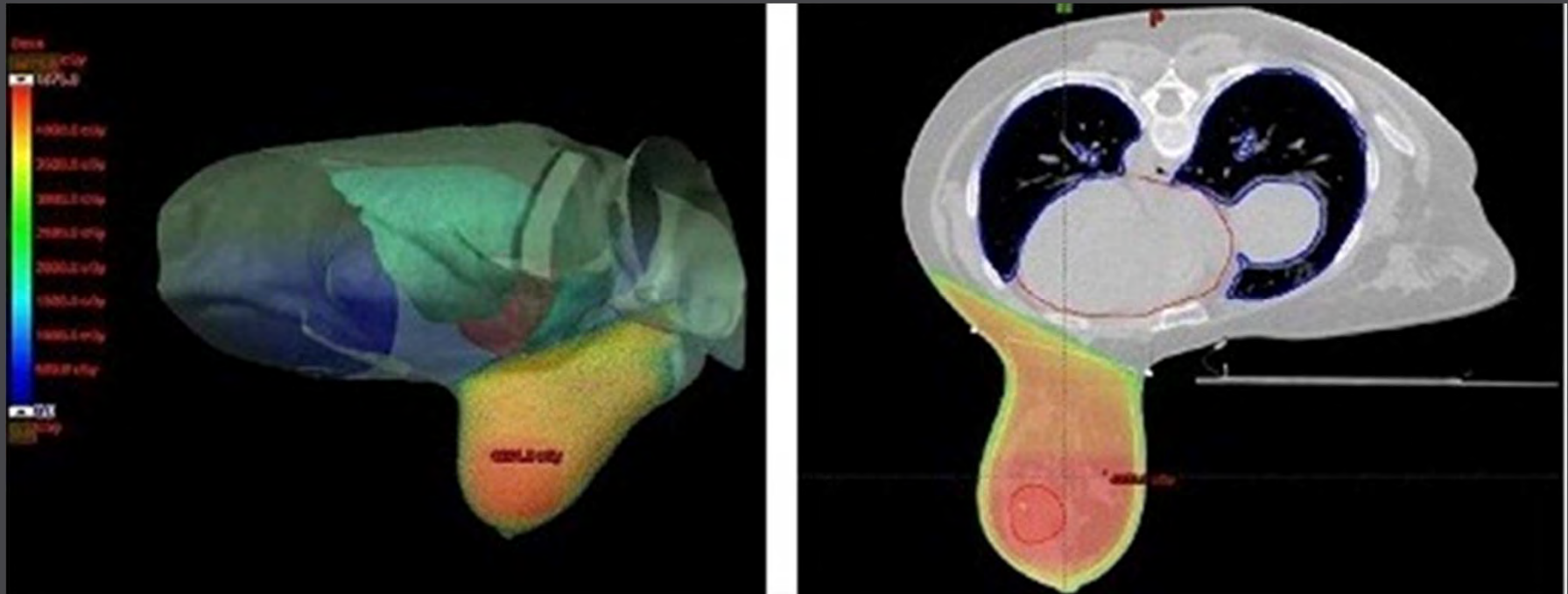
Deep Inspiratory breath hold for heart avoidance



Prone positioning for pendulous breasts and heart/lung avoidance

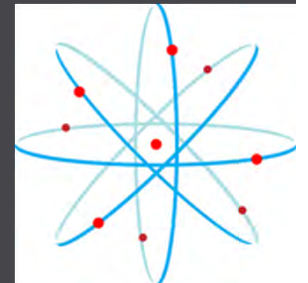


Prone positioning for pendulous breasts and heart/lung avoidance



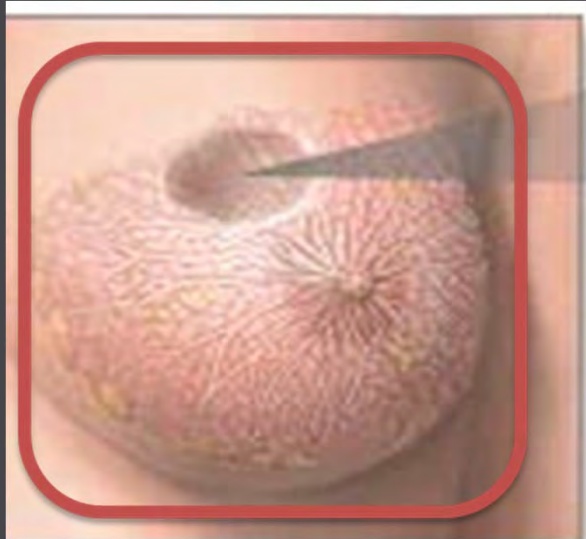
Hypofractionated Whole Breast Radiation: a more convenient alternative

- Hypofractionated whole breast radiation
 - Identical to standard fractionation whole breast RT but larger dose given per day
 - Approximately 3-4 weeks, daily Mon-Fri, 10 mins per day
- Ideal candidates for hypofractionation
 - < 5cm, node negative breast cancer
 - No chemo
 - Age>50
 - Smaller breast size

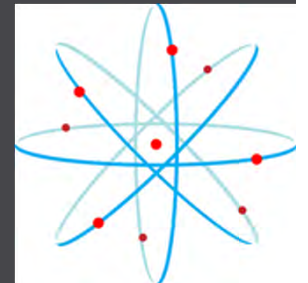
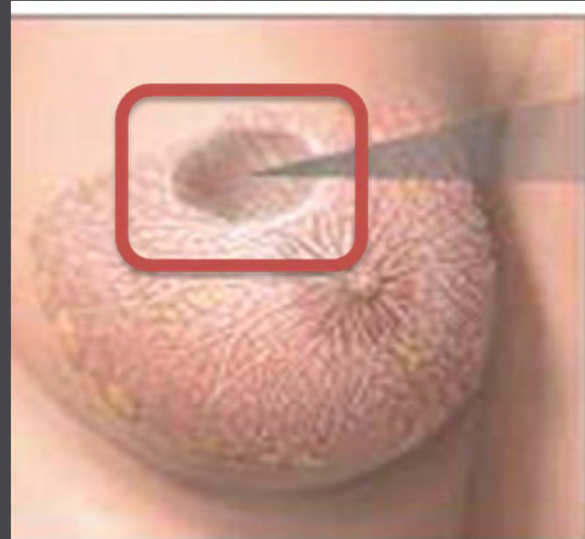


Radiation Therapy Target-Partial Breast Irradiation

- Whole Breast

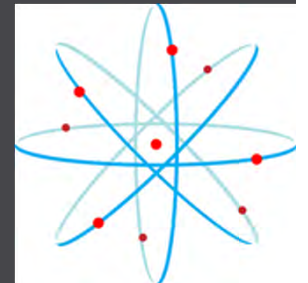


- Partial Breast



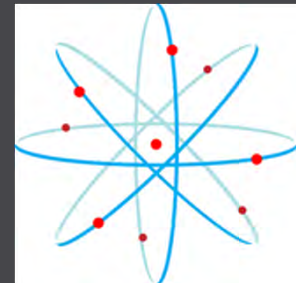
Accelerated Partial Breast Irradiation (APBI)

- Rationale: majority of in breast recurrences occur at or near the lumpectomy site
- Advantages:
 - Patient convenience: 1 week alternative
 - Less normal tissue exposure
- Suitable candidates for partial breast irradiation
 - Age ideally >60
 - Tumor size <2cm
 - Negative nodes
 - Negative margins
 - Favorable features: ER+, no LVSI

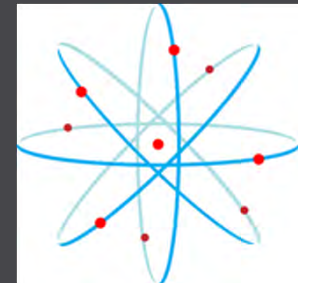
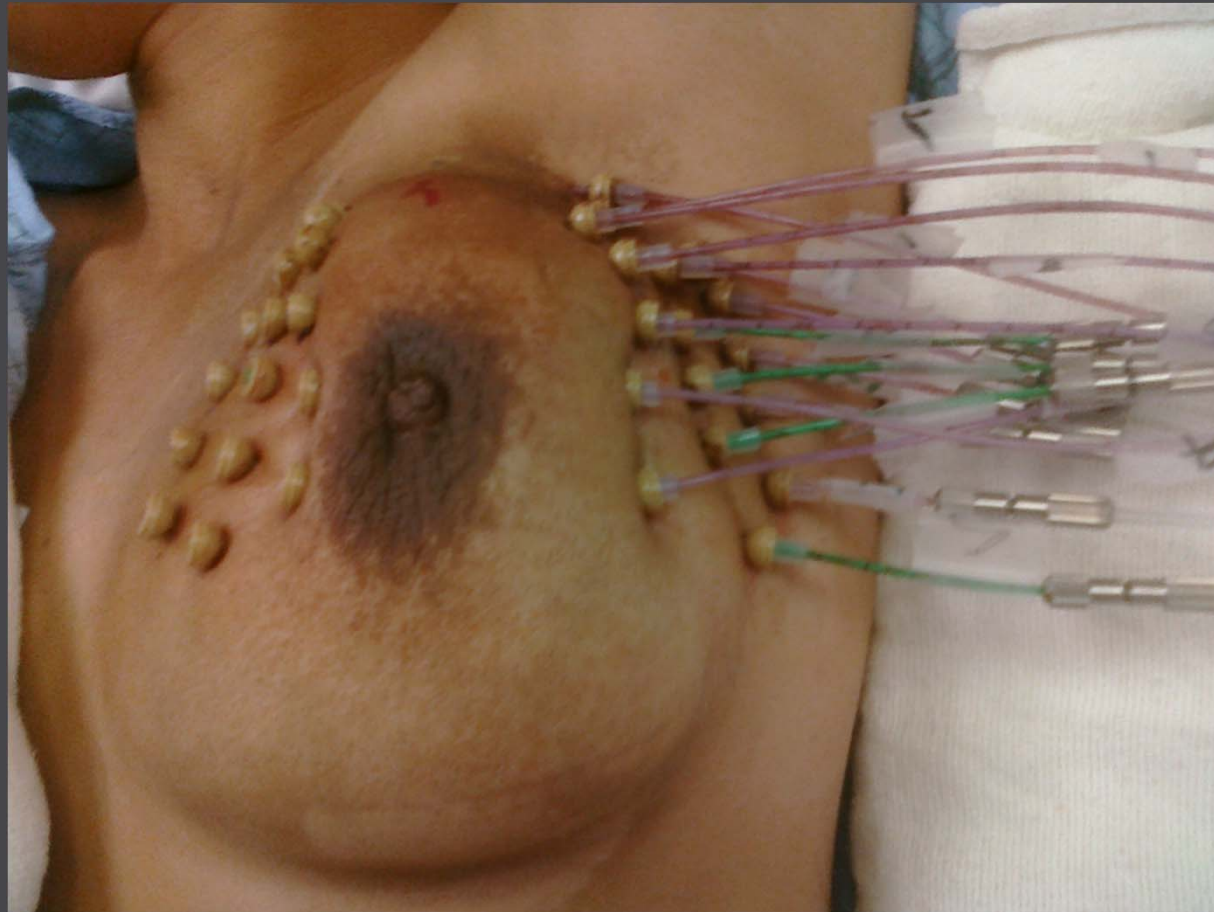


APBI

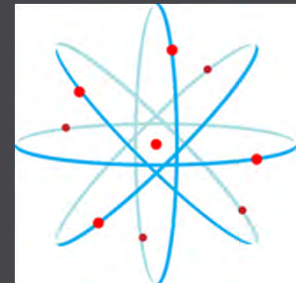
- Multiple techniques
 - Interstitial
 - Intracavitary
 - External Beam
 - Intraoperative Radiation Therapy (IORT)



Interstitial APBI

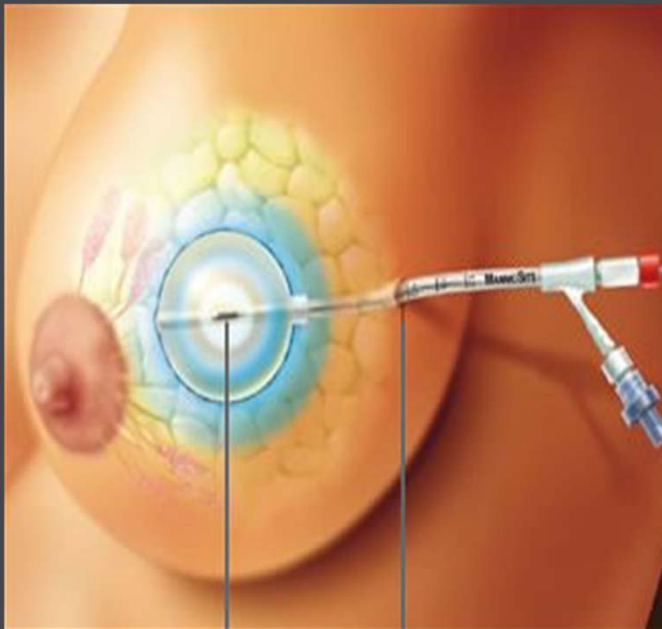


Remote Afterloader for Brachytherapy Techniques

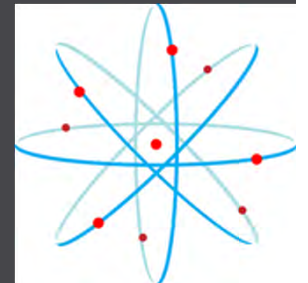
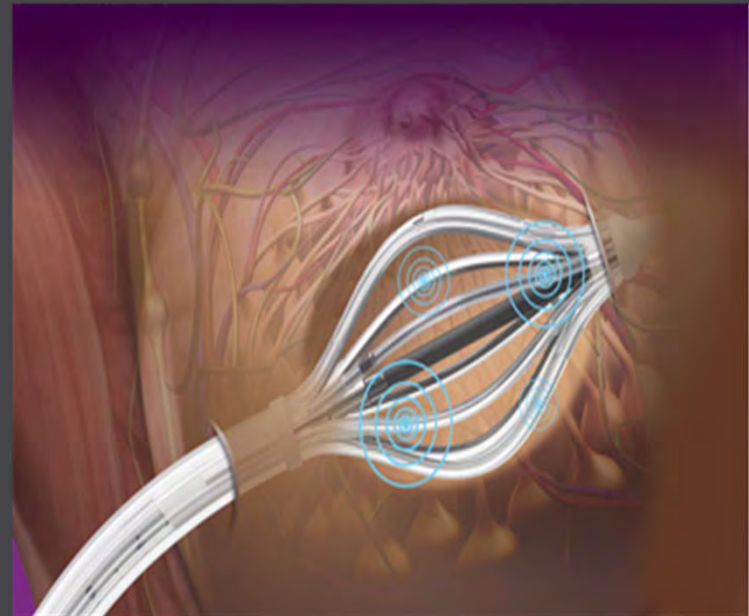


Intracavitary APBI

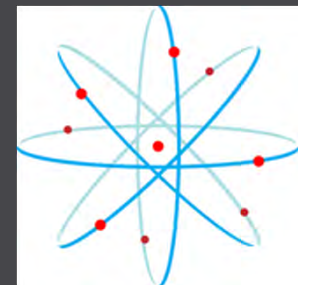
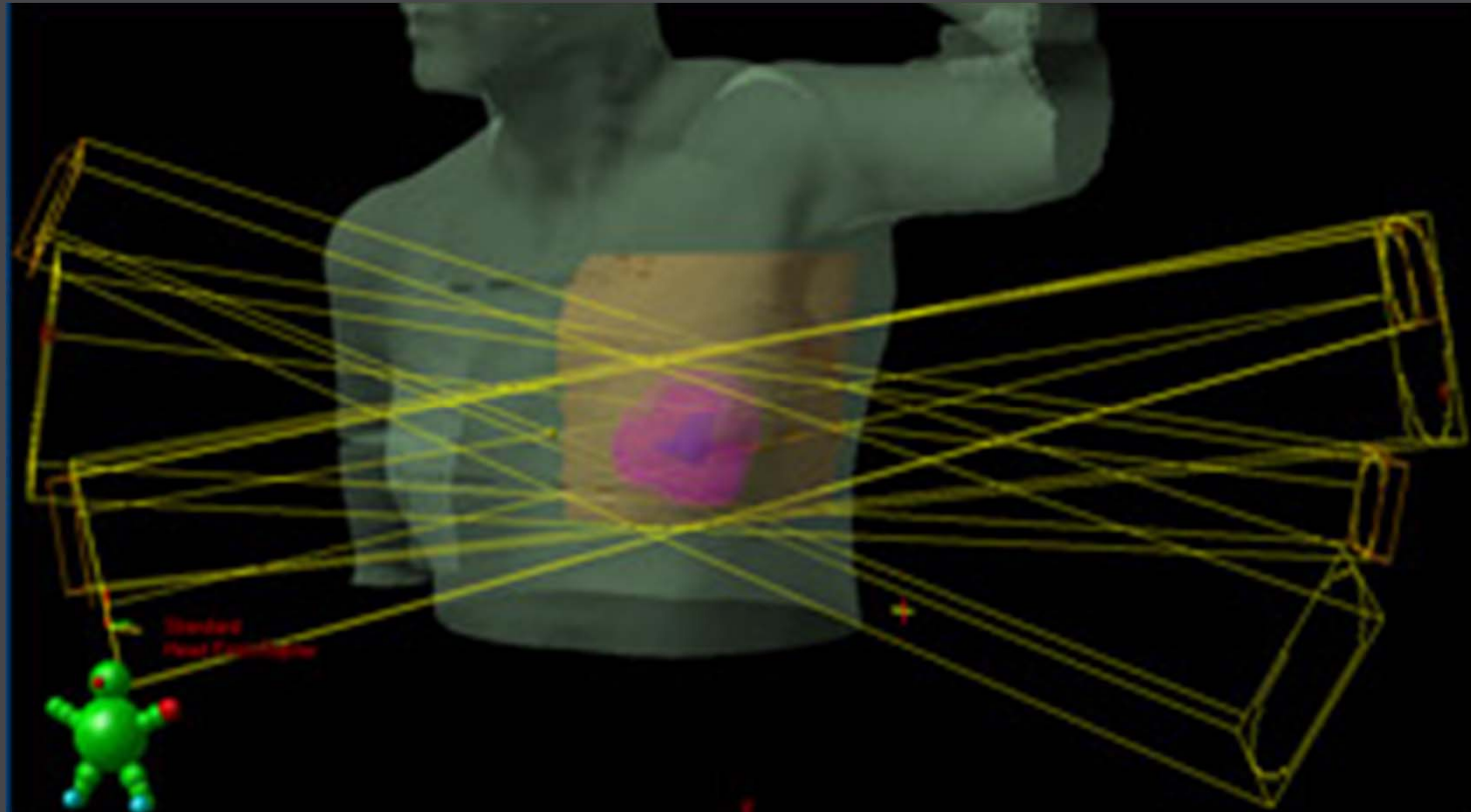
Mammosite



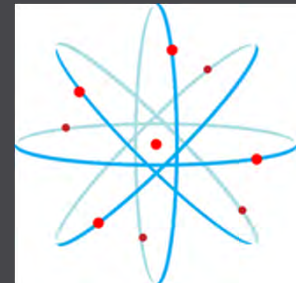
Savi



External Beam APBI

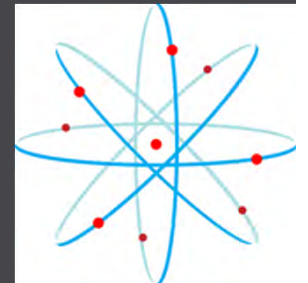


Intraoperative Radiation (IORT)



Conclusions

- Radiation therapy is a critical component of the standard management of early stage breast cancer
- Women today benefit from a multitude of advanced treatment planning techniques intended to minimize side effects and maximize convenience



Thank you

Questions?

